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09/262,657	03/04/1999	SHUNPEI YAMAZAKI	SEL-126	9735

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EXAMINER	
PRENTY, MARK V	
ART UNIT	PAPER NUMBER
2822	22

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/262,657	Applicant(s) YAMAZAKI et al.
	Examiner Prenty	Art Unit 2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *three* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *Jun 11, 2002* .

2a) ☒ This action is **FINAL.** 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1, 2, 4, 5, 7, 8, 10, 11, 13, 14, and 30-48* is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1, 2, 4, 5, 7, 8, 10, 11, 13, 14, and 30-48* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
4) ☐ Interview Summary (PTO-413) Paper No(s). _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

This Office Action is in response to the amendment filed June 11, 2002.

Claims 30-38, 41-43 and 46-48 are rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With respect to independent claim 30, the specification does not describe first and second thin film transistors "wherein the semiconductor film of said second thin film transistor contains germanium and the semiconductor film of the first thin film transistors is not intentionally added with germanium and a concentration of germanium in the semiconductor film of the second thin film transistor is higher than a concentration of germanium in the semiconductor film of the first thin film transistor," as recited in independent claim 30. Rather, the specification discloses that the semiconductor films of claim 30's first and second thin film transistors consist of silicon (Si) and silicon germanium (SiGe), respectively. See the specification at page 8, lines 13-21, for example.

Claims 31, 32, 41, 46 and 47 depend on independent claim 30 and are thus similarly rejected. Claim 31 is further rejected because the specification does not describe "wherein the semiconductor film of said plurality of fist [sic] thin film transistors is not added with germanium while the semiconductor film of said second thin film transistor is added with germanium." Again, the specification discloses that the semiconductor films of claim 30's first and second thin film transistors consist of silicon (Si) and silicon germanium (SiGe), respectively. See the specification at page 8, lines 13-21, for example.

With respect to independent claim 33, the specification does not describe first and second thin film transistors "wherein said first semiconductor film contains germanium at a higher concentration than said second semiconductor film and the second semiconductor film is not intentionally added with germanium," as recited in independent claim 33. Rather, the specification describes first and second thin film transistors wherein one semiconductor film consists of silicon germanium (SiGe) and the other semiconductor film consists of silicon (Si). See the specification at page 8, lines 13-21, for example.

Claims 34, 35 and 42 depend on independent claim 33 and are thus similarly rejected. Claim 34 is further rejected because the specification does not describe "wherein said first semiconductor film is added with germanium while the second semiconductor film is not intentionally added with germanium." Rather, the specification describes first and second thin film transistors wherein one semiconductor film consists of silicon germanium (SiGe) and the other semiconductor film consists of silicon (Si). See the specification at page 8, lines 13-21, for example.

With respect to independent claim 36, the specification does not describe first and second thin film transistors "wherein said first semiconductor film contains germanium at a higher concentration than said second semiconductor film and the second semiconductor film is not intentionally added with germanium," as recited in independent claim 36. Rather, the specification describes first and second thin film transistors wherein one semiconductor film consists of silicon germanium (SiGe) and the other semiconductor film consists of silicon (Si). See the specification at page 8, lines 13-21, for example.

Claims 37, 38, 43 and 48 depend on independent claim 36 and are thus

similarly rejected. Claim 37 is further rejected because the specification does not describe "wherein said first semiconductor film is added with germanium while the second semiconductor film is not intentionally added with germanium." Rather, the specification describes first and second thin film transistors wherein one semiconductor film consists of silicon germanium (SiGe) and the other semiconductor film consists of silicon (Si). See the specification at page 8, lines 13-21, for example.

Claims 30-38, 41-43 and 46-48 are rejected under 35 U.S.C. §112, first paragraph, because the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention.

With respect to independent claim 30, the specification is non-enabling for first and second thin film transistors "wherein the semiconductor film of said second thin film transistor contains germanium and the semiconductor film of the first thin film transistors is not intentionally added with germanium and a concentration of germanium in the semiconductor film of the second thin film transistor is higher than a concentration of germanium in the semiconductor film of the first thin film transistor," as recited in claim 30. Rather, the specification is enabling for claim 30's first and second thin film transistors consisting of silicon (Si) and silicon germanium (SiGe), respectively. See the specification at page 8, lines 13-21, for example.

Claims 31, 32, 41, 46 and 47 depend on independent claim 30 and are thus similarly rejected. Claim 31 is further rejected because the specification is non-enabling for "wherein the semiconductor film of said plurality of fist [sic] thin film transistors is not added with germanium while the semiconductor film of said second thin film transistor is added with germanium." Rather, the specification is enabling for

claim 30's first and second thin film transistors consisting of silicon (Si) and silicon germanium (SiGe), respectively. See the specification at page 8, lines 13-21, for example.

With respect to independent claim 33, the specification is non-enabling for first and second thin film transistors "wherein said first semiconductor film contains germanium at a higher concentration than said second semiconductor film and the second semiconductor film is not intentionally added with germanium," as recited in independent claim 33. Rather, the specification enables first and second thin film transistors wherein one semiconductor film consists of silicon germanium (SiGe) and the other semiconductor film consists of silicon (Si). See the specification at page 8, lines 13-21, for example.

Claims 34, 35 and 42 depend on independent claim 33 and are thus similarly rejected. Claim 34 is further rejected because the specification is non-enabling for "wherein said first semiconductor film is added with germanium while the second semiconductor film is not intentionally added with germanium." Rather, the specification enables first and second thin film transistors wherein one semiconductor film consists of silicon germanium (SiGe) and the other semiconductor film consists of silicon (Si). See the specification at page 8, lines 13-21, for example.

With respect to independent claim 36, the specification is non-enabling for first and second thin film transistors "wherein said first semiconductor film contains germanium at a higher concentration than said second semiconductor film and the second semiconductor film is not intentionally added with germanium," as recited in independent claim 36. Rather, the specification enables first and second thin film transistors wherein one semiconductor film consists of silicon germanium (SiGe) and

the other semiconductor film consists of silicon (Si). See the specification at page 8, lines 13-21, for example.

Claims 37, 38, 43 and 48 depend on independent claim 36 and are thus similarly rejected. Claim 37 is further rejected because the specification is non-enabling for "wherein said first semiconductor film is added with germanium while the second semiconductor film is not intentionally added with germanium." Rather, the specification enables first and second thin film transistors wherein one semiconductor film consists of silicon germanium (SiGe) and the other semiconductor film consists of silicon (Si). See the specification at page 8, lines 13-21, for example.

Claims 31, 34 and 37 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 31 is incorrect in reciting "wherein the semiconductor film of said plurality of fist [sic] thin film transistors is not added with germanium while the semiconductor film of said second thin film transistor is added with germanium." The specification discloses that claim 31's first thin film transistor's active layer consists of silicon (Si) and that claim 31's second thin film transistor's active layer consists of silicon germanium (SiGe).

Claim 34 is incorrect in reciting "wherein said first semiconductor film is added with germanium while the second semiconductor film is not intentionally added with germanium." The specification discloses first and second thin film transistors wherein one semiconductor film consists of silicon germanium (SiGe) and the other semiconductor film consists of silicon (Si). See the specification at page 8, lines 13-21, for example.

Claim 37 is incorrect in reciting "wherein said first semiconductor film is added with germanium while the second semiconductor film is not intentionally added with germanium." The specification discloses first and second thin film transistors wherein one semiconductor film consists of silicon germanium (SiGe) and the other semiconductor film consists of silicon (Si). See the specification at page 8, lines 13-21, for example.

Claims 2, 5, 11, 14, 40 and 45 are rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. (United States Patent 5,614,733 cited in the Information Disclosure Statement filed April 23, 2001) together with King et al. (the *IEEE Transactions on Electron Devices* article submitted in the Information Disclosure Statement filed October 10, 2000).

The difference between Zhang et al. (see the entire patent) and the set of rejected claims is their complementary driver circuit transistors are formed in polycrystalline silicon and polycrystalline silicon germanium, respectively.

King et al. teach that it is advantageous to form complementary driver circuit transistors in polycrystalline silicon-germanium rather than polycrystalline silicon.

It would have been obvious to one skilled in this art to advantageously form Zhang et al's complementary driver circuit transistors (but not its pixel circuit transistors, which Zhang et al. disclose are on a different design footing than the driver circuit transistors), in polycrystalline silicon-germanium, rather than polycrystalline silicon, as taught by King et al.

Claims 2, 5, 11, 14, 40 and 45 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. together with King et al.

Claim 8 is rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang

et al. (United States Patent 5,614,733 cited in the Information Disclosure Statement filed April 23, 2001, hereinafter Zhang et al. '733) together with King et al. (the *IEEE Transactions on Electron Devices* article submitted in the Information Disclosure Statement filed October 10, 2000) and Zhang et al. (United States Patent 5,648,277 cited in the Information Disclosure Statement filed March 4, 1999, hereinafter Zhang et al. '277).

The difference between the obvious Zhang et al. '733 / King et al. device and claim 8 is their second, matrix thin films comprise polycrystalline silicon and amorphous silicon, respectively.

Zhang et al. '277 teach forming second, matrix thin films from amorphous silicon (see its Fig. 6 disclosure).

It would have been further obvious to one skilled in this art to form the obvious Zhang et al. '733 / King et al. device's second, matrix thin film of amorphous silicon instead of polysilicon, as suggested by Zhang et al. '277.

Claim 8 is thus rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. '733 together with King et al. and Zhang et al. '277.

Claims 1, 4, 10, 13, 30-35, 39, 41, 42, 44, 46 and 47, insofar as understood, are rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. (United States Patent 5,614,733 cited in the Information Disclosure Statement filed April 23, 2001) together with King et al. (the *IEEE Transactions on Electron Devices* article submitted in the Information Disclosure Statement filed October 10, 2000).

Specifically, the difference between Zhang et al. (see the entire patent) and the set of rejected claims is their complementary driver circuit transistors are formed in polycrystalline silicon and polycrystalline silicon germanium, respectively.

King et al. teach that it is advantageous to form complementary driver circuit transistors in polycrystalline silicon-germanium rather than polycrystalline silicon.

It would have been obvious to one skilled in this art to advantageously form Zhang et al's complementary driver circuit transistors (but not its pixel circuit transistors, which Zhang et al. disclose are on a different design footing than the driver circuit transistors), in polycrystalline silicon-germanium, rather than polycrystalline silicon, as taught by King et al.

Claims 1, 4, 10, 13, 30-35, 39, 41, 42, 44, 46 and 47 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. together with King et al.

Claims 7, 36-38, 43 and 48, insofar as understood, are rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. (United States Patent 5,614,733 cited in the Information Disclosure Statement filed April 23, 2001, hereinafter Zhang et al. '733) together with King et al. (the *IEEE Transactions on Electron Devices* article submitted in the Information Disclosure Statement filed October 10, 2000) and Zhang et al. (United States Patent 5,648,277 cited in the Information Disclosure Statement filed March 4, 1999, hereinafter Zhang et al. '277).

The difference between the obvious Zhang et al. '733 / King et al. device and the set of rejected claims is their second, matrix thin films comprise polycrystalline silicon and amorphous silicon, respectively.

Zhang et al. '277 teach forming second, matrix thin films from amorphous silicon (see its Fig. 6 disclosure).

It would have been further obvious to one skilled in this art to form the obvious Zhang et al. '733 / King et al. device's second, matrix thin film of amorphous silicon instead of polysilicon, as suggested by Zhang et al. '277.

Claims 7, 36-38, 43 and 48, insofar as understood, are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. '733 together with King et al. and Zhang et al. '277.

The applicants' arguments are not persuasive.

First, the applicants continue to mischaracterize the invention. Specifically, contrary to the applicants' allegation: "Applicants' invention resides in the use of the TFT having a channel region comprising silicon doped with germanium in a selected portion of the semiconductor device depending upon the required characteristics of the circuits," (emphasis in original), the applicants' invention actually "resides" in using silicon germanium (i.e., SiGe) semiconductor film for selected thin film transistors of a semiconductor device and using silicon (i.e., Si) semiconductor film for the remaining thin film transistors of the semiconductor device, depending upon the required characteristics of the semiconductor device's circuits (i.e., the invention resides in using SiGe, not silicon doped with germanium). See the Abstract of the Disclosure, for example.

The applicants' argument with respect to the rejections of claims 30-38 and 41-43 under 35 U.S.C. §112, first paragraph, is not persuasive.

First, the applicants fail to even address, let alone rebut, the examiner's reliance on the specification at page 8, lines 13-21.

Furthermore, the applicants' reliance on the specification at page 5, lines 14-27, is misplaced, because that portion of the specification also supports the rejection.

Furthermore, the applicants' reliance on the specification at page 6, lines 16-25, is also misplaced, because it ignores the specification's subsequent disclosure at page 6, lines 26-29, and at page 7, lines 1-4, for example.

Finally, the applicants' argument is not persuasive because it is not commensurate in scope with the rejected claims. Specifically, rejected independent claim 30, for example, does not recite first and second thin films, it recites first and second thin film transistors, and the thin films of those first and second thin film transistors consist of silicon (Si) and silicon germanium (SiGe), respectively. Again, see the specification at page 8, lines 13-21, and/or at page 5, lines 14-21, for example.

The applicants' argument with respect to the rejection of claims 31, 34 and 37 under 35 U.S.C. §112, second paragraph, is not persuasive, because it falls with its argument with respect to the rejections of those claims under 35 U.S.C. §112, first paragraph.

The applicants continue to fail to even specifically address, let alone rebut, the stated rejection of claims 2, 5, 11, 14 and 40 under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. together with King et al.

The applicants continue to fail to even specifically address, let alone rebut, the stated rejection of claim 8 under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. '733 together with King et al. and Zhang et al. '277.

The applicants continue to fail to even specifically address, let alone rebut, the stated rejection of claims 1, 4, 10, 13, 30-35, 39, 41 and 42 under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. together with King et al.

The applicants continue to fail to even specifically address, let alone rebut, the stated rejection of claims 7, 36-38 and 43 under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. '733 together with King et al. and Zhang et al. '277.

The applicants generically allege that no motivation to combine has been provided in "the rejection," but fail to even specifically address, let alone rebut, any of

the four rejections under 35 U.S.C. §103(a).

The applicants nominally mention the Zhang et al. '733 and King et al. references, but completely ignore the manner in which those references have been applied in the various 35 U.S.C. §103(a) rejections.

Finally, the applicant's allegation: "the Examiner's proposed combination of Zhang and King fails to disclose or suggest the invention recited in dependent claims 39, 40, 41, 42 and 43 as these claims recite that the semiconductor film contains both germanium and a metal selected from the group consisting of nickel, iron, cobalt and platinum and that is not disclosed or suggested by either references [sic]," [emphasis in original], is false. The obvious Zhang et al. / King et al. semiconductor device would, in fact, comprise a semiconductor film containing both germanium and a metal selected from the group consisting of nickel, iron, cobalt and platinum. Specifically, Zhang et al's silicon semiconductor films contain a metal selected from the group consisting of nickel, iron, cobalt and platinum (see Zhang et al. '733's claim 4, for example), and King et al. teach forming some of Zhang et al's silicon thin films of silicon germanium instead.

Applicants' amendment necessitated the new grounds of rejection. Accordingly, **THIS ACTION IS MADE FINAL.** See M.P.E.P. §706.07(a). Applicants are reminded of the extension of time policy set forth in 37 C.F.R. §1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. §1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD

FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

Registered practitioners can telephone examiner Prenty at (703) 308-4939. Any voicemail message left for the examiner must include the name and registration number of the registered practitioner calling, and the application's Serial Number. Technology Center 2800's general telephone number is (703) 308-0956.

Mark Prenty

Mark V. Prenty
Primary Examiner